

| **Advanced Corporate Finance**

2. Financial Planning, from Accounting to Free Cash Flows

Objectives of the session

1. Show how to use accounting information to compute cash flows
2. Understand and compute “free cash flows” (FCF)
3. Introduce financial forecasting (income statement, statement of cash flows, balance sheet)
4. Introduce the sustainable growth rate of a company

Summarized balance sheet

Assets

Fixed assets (FA)

Working capital requirement (WCR)

Cash (Cash)

Liabilities

Stockholders' equity (SE)

Interest-bearing debt (D)

$$\text{FA} + \text{WCR} + \text{Cash} = \text{SE} + \text{D}$$

Working capital requirement : definition

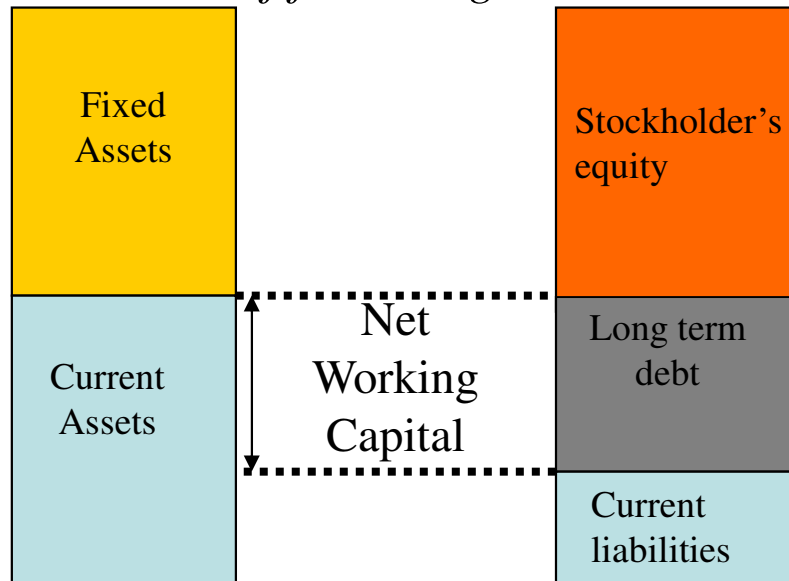
- + Accounts receivable
- + Inventories
- + Prepaid expenses
- Account payable
- Accrued payroll and other expenses

Interest-bearing debt: definition

- + Long-term debt
- + Current maturities of long term debt
- + Notes payable to banks

Net Working Capital

- Net working capital can be understood in two ways:
 - *as an investment to be funded*: Current Assets - Current Liabilities
 - *as a source of financing*=Stockholders' equity + LT debt - Fixed Assets



Current ratio: a measure of NWC

Current ratio =

Current assets / Current liabilities

Net working capital =

Current assets - Current liabilities

Current ratio > 1

⇔ NWC > 0

Notations

- **Income statement**

- REV Revenue
- CGS Cost of goods sold
- SGA Selling, general and administrative expenses
- Dep Depreciation
- EBIT Earnings before interest and taxes
- Int Interest expenses
- TAX Taxes
- T_c Tax rate
- NI Net income

- **Balance sheet**

- FA Fixed assets, net
- AR Accounts receivable
- INV Inventories
- CASH Cash & cash equivalents
- SE Equity capital
- LTD Long term debt
- AP Accounts payable
- STD_{fin} Short-term borrowing

- **Statement of retained income**

- DIV Dividends

Net Working Capital vs Working Capital Requirement

- Summarized balance sheet identity:
 - $FA + WCR + CASH = SE + LTD + STD$
- can be written as:
 - $WCR + (CASH - STD_{fin}) = (SE + LTD - FA)$

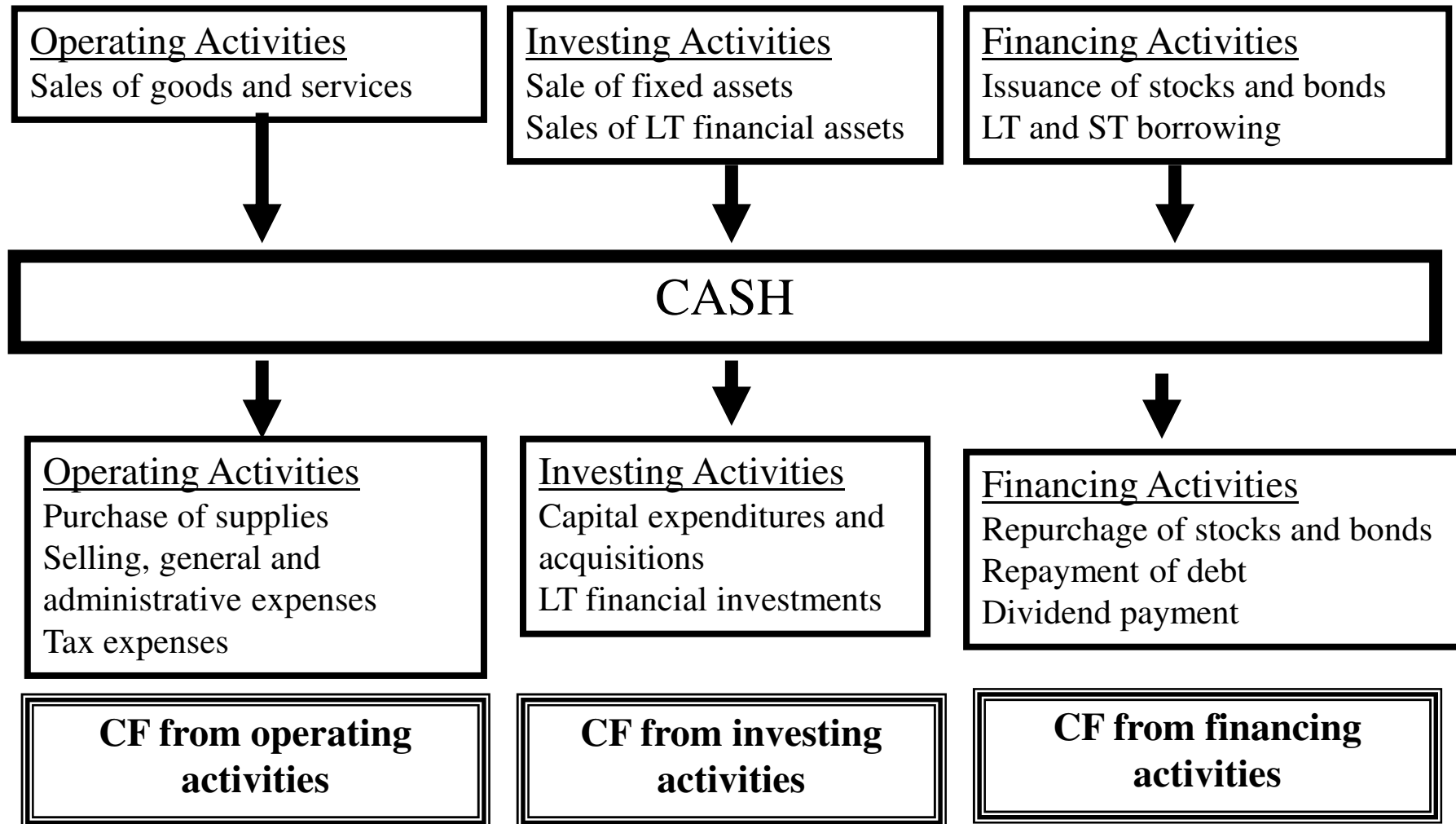
Working
Capital
Requirement

Net Liquid
Balance

Net Working
Capital

- $WCR + NLB = NWC$

Sources of Cash In and Out flows



Example (Dour Music Festival Balance Sheet, 2009, Assets)

| Assets | 2009 | 2008 |
|--------------------------------|------------------|------------------|
| Fixed Assets (FA) | 598 | 198 |
| Financial Fixed assets. | 598 | 198 |
| Current Assets | 2.037.080 | 2.166.569 |
| Accounts receivable < one year | 377.637 | 62.229 |
| Cash and cash equivalents | 1.659.443 | 2.104.340 |
| TOTAL | 2.037.678 | 2.166.767 |

Example (Dour Music Festival Balance Sheet, 2009, Liabilities)

| Liabilities | 2009 | 2008 |
|-------------------------------|------------------|------------------|
| Equity | 817.343 | 777.572 |
| Equity | 30.987 | 30.987 |
| Reserves | 3.099 | 3.099 |
| Reported P&L | 783.257 | 743.486 |
| Debts | 1.220.335 | 1.389.195 |
| LT debts | | |
| ST Debts | 1.220.335 | 1.389.195 |
| Financial debts | | |
| Accounts payable | 368.752 | 171.279 |
| Social security and wages due | 447.528 | 576.555 |
| Other current liabilities | 404.055 | 641.361 |
| TOTAL | 2.037.678 | 2.166.767 |

WCR, NWC, Cash...

- $NWC = SE + LTD - FA = 817,343 + 0 - 598 = 816,745$
- $NLB = CASH - STD_{fin} = 1,659,443$
- $WCR = (2,037,080 - 1,659,443) - 1,220,335 = -842,698$
- Check: $NLB = NWC - WCR = 816,745 - (-842,698) = 1,659,443$
- But what about Free Cash Flows?

Example (Dour Music Festival income statement, 2009)

| | 2009 | 2008 |
|-----------------------------------|----------------|------------------|
| Operating Profit | 531.410 | 1.727.569 |
| Interest received | 147.305 | 154.872 |
| Interest paid | 3.028 | 2.523 |
| Current Gain/Losses | 675.687 | 1.879.918 |
| Extraordinary Income | | |
| Extraordinary expenses | 13.344 | |
| Profit (loss) before taxes | 662.343 | 1.879.918 |
| Taxes | 222.572 | 674.918 |
| Tc | 33,60% | 35,90% |
| Profit (loss) after taxes | 439.771 | 1.205.000 |
| Dividend | 400.000 | 750.000 |

Income statement and balance sheet

- Income statement
 - $EBIT = REV - CGS - SGA - Dep = 531,410 - 13,344 = 518,066$
 - $TAX = T_c (EBIT - Int) = 33,6\% \times (518,066 + 144,277) = 222,572$
 - $NI = EBIT - Int - TAX = 518,066 + 144,277 - 222,572 = 439,771$

- Balance sheet equation
 - $FA + AR + INV + CASH = SE + LTD + AP + STD$
 - $598 + 377,637 + 0 + 1,659,443 = 817,343 + 0 + 1,220,335 + 0$

Working capital requirement: $WCR \equiv AR + INV - AP$

$$= (\text{Current assets} - CASH) - (\text{Current liabilities} - STD) = - 842,698$$

Summarised balance sheet:

$$FA + WCR + CASH = SE + D \quad (D = LTD + STD_{fin})$$

$$598 - 842,698 + 1,659,443 = 817,343 + 0 = 817,343$$

Cash flow statement : indirect method

$$\Delta FA + \Delta WCR + \Delta CASH = \Delta SE + \Delta D$$

$$\Delta FA = AQ - AMO$$

AQ = Acquisitions - Disposals (investing & divesting)

$$= 598 - 198 = 400$$

$$\Delta WCR = -842,698 - (-1,326,966) = 484,268$$

$$\Delta Cash = 2,104,340 - 1,659,443 = -444,897$$

$$\Delta SE = NI - DIV + \Delta K = 439,771 - 400,000 + 0 = 39,771$$

ΔK = New issuance of capital

Cash flow statement : indirect method

$$(NI + AMO - \Delta WCR) - (AQ) + (\Delta K + \Delta D - DIV) = \Delta CASH$$

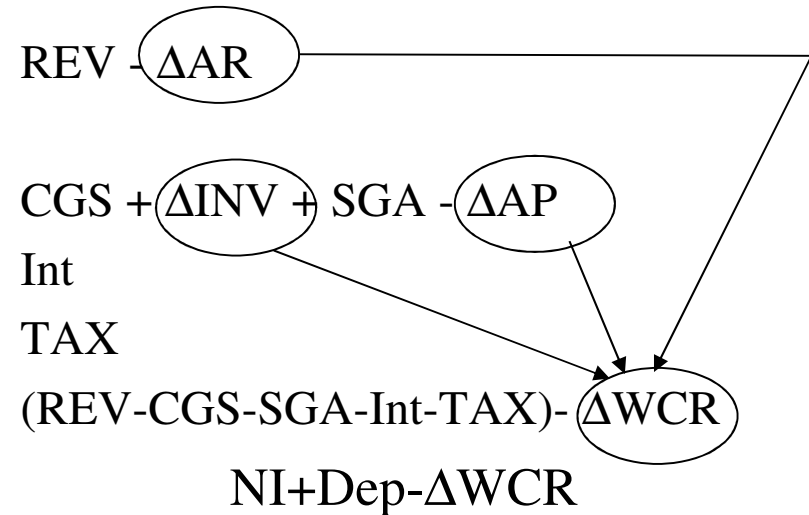
$$\begin{array}{l} \text{Cash flow from} \\ \text{operating} \\ \text{activities} \end{array} + \begin{array}{l} \text{Cash flow from} \\ \text{investing} \\ \text{activities} \end{array} + \begin{array}{l} \text{Cash flow} \\ \text{from} \\ \text{financing} \\ \text{activities} \end{array} = \Delta CASH$$

- $439,771 + 0 - 484,268 + (-400) + (-400,000) = -444,897$

- $-44,497 + (-400) - 400,000 = -444,897$

Statement of cash flows: direct method

- + Cash collection from customers
- Cash payment to suppliers and employees
- Cash paid for interest
- Cash paid for taxes
- = **Cash flow from operating activities**



+ **Cash flow from investing activities**

-AQ

+ **Cash flow from financing activity**

$\Delta K + \Delta D - DIV$

= **$\Delta CASH$**

$$(NI + Dep - \Delta WCR) + (-AQ) + (\Delta K + \Delta D - DIV) = \Delta CASH$$

Free Cash Flow

- Several definitions...
- Free Cash Flow = Cash flow from operating activities
+ Cash flow from investing activities
- Calculating free cash flows of all equity firm:

$$\text{Free Cash Flow} = \text{EBIT}(1-T_C) + \text{Dep} - \Delta\text{WCR} - \text{AQ}$$

- Statement of cash flows for all-equity firm:

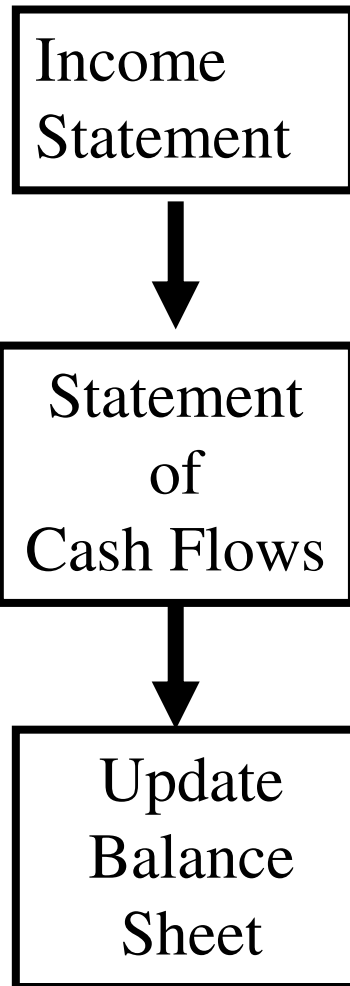
$$\text{Free Cash Flow} = \text{DIV} - \Delta\text{K} + \Delta\text{Cash}$$

Free Cash Flow to Equity

- Free Cash Flow to Equity = Cash the company can afford to return to its stockholders
- $(NI + Dep - \Delta WCR) + (-AQ) + (\Delta K + \Delta D - DIV) = \Delta CASH$
- Calculating free cash flows to equity:
- Free Cash Flow to Equity = $NI - (AQ - Dep) - \Delta WCR + \Delta D$
- Amount which may be used to buyback shares or pay dividends

Since Free Cash Flow to Equity = $-\Delta K + DIV + \Delta CASH$

Financial Forecasting



EBITDA
 -Depreciation
 =EBIT
 -Taxes
 = Net Income

CF from operating activities
 CF from investing activities
 CF from financing activities

Financial Planning

- Based on Δ Revenues
- Assumptions on key ratios relating Δ Revenues to:
 - Gross margin: $m = \text{EBITDA} / \text{Revenues}$
 - Working capital requirement: $w = \Delta \text{WCR} / \Delta \text{Revenues}$
 - Net fixed assets: $a = \Delta \text{NFA} / \Delta \text{Revenues}$
- Financial policy:
 - Payout ratio $p = \text{DIV} / \text{Net Income}$
 - Depreciation $d = \text{Depreciation} / \text{Fixed Assets}_{-1}$
- Environment:
 - Tax rate T_C
 - Cost of debt i

- Revenues year 0: 2,000
- Growth rate year 1: 25%
- Balance sheet end year 0

| | |
|---|-------|
| Net Fixed Assets | 600 |
| Working Capital Requirement | 400 |
| Cash | 0 |
| Total Assets | 1,000 |
| Book Equity | 600 |
| Debt (financial) | 400 |
| Total Liabilities + Stockholders' equity | 1,000 |

Gross margin: $m = 30\%$

WCR: $w = 20\%$

Net fixed assets: $a = 30\%$

Payout ratio $p = 50\%$

Depreciation $d = 10\%$

Tax rate $T_C = 40\%$

Cost of debt $i = 10\%$

Step 1: Income statement

| | Year 0 | Year 1 | |
|--------------|--------|--------|---------------------|
| Sales | 2,000 | 2,500 | $Rev_{-1} (1+g)$ |
| EBITDA | | 750 | $m \times Rev$ |
| Depreciation | | 60 | $d \times NFA_{-1}$ |
| EBIT | | 690 | |
| Interests | | 40 | $i \times D_{-1}$ |
| Taxes | | 260 | |
| Net Income | | 390 | |

Step 2: Statement of Cash Flows

| | Year 0 | Year 1 | |
|--------------------------------|--------|-------------|----------------------------|
| Net Income | | 390 | From Income Stat. |
| Depreciation | | 60 | From Income Stat. |
| Δ WCR | | 100 | $w \times \Delta$ Revenues |
| CF from operations | | 350 | |
| Δ NFA | | 150 | $a \times \Delta$ Revenues |
| Depreciation | | 60 | |
| CF from investing | | -210 | |
| Div | | 195 | $p \times$ Net Income |
| Stock Issues/buy back | | 0 | <i>Assumption</i> |
| Δ Debt | | 55 | <i>Plug</i> |
| CF from financing | | -140 | |
| ΔCash | | 0 | |

Step 3: Update balance sheet

| | Year 0 | Year 1 | |
|------------------|--------|--------|----------------------------|
| Net Fixed Assets | 600 | 750 | $NFA_{-1} + Inv - Dep$ |
| Working Capital | 400 | 500 | $WCR_{-1} + \Delta WCR$ |
| Cash | 0 | 0 | $Cash_{-1} + \Delta Cash$ |
| | 1,000 | 1,250 | |
| Book Equity | 600 | 795 | $BEq_{-1} + SI + NI - DIV$ |
| Debt | 400 | 455 | $D_{-1} + \Delta D$ |
| | 1,000 | 1,250 | |

The Full Model

| | | <u>Year 0</u> | <u>Year 1</u> | <u>Year 2</u> | <u>Year 3</u> | <u>Year 4</u> |
|--------------------|-----|---------------------------------------|---------------|---------------|---------------|---------------|
| Financial planning | | | | | | |
| Sales growth rate | 25% | | | | | |
| Gross margin | 30% | | | | | |
| Depreciation rate | 10% | | | | | |
| Cost of debt | 10% | | | | | |
| Tax rate | 40% | | | | | |
| Payout | 50% | | | | | |
| WC/Sales | 20% | | | | | |
| NFA/Sales | 30% | | | | | |
| | | <u>Income Statement</u> | | | | |
| | | 2,000 | 2,500 | 3,125 | 3,906 | 4,883 |
| | | | 750 | 938 | 1,172 | 1,465 |
| | | | 60 | 75 | 94 | 117 |
| | | | 690 | 863 | 1,078 | 1,348 |
| | | | 40 | 46 | 52 | 61 |
| | | | 260 | 327 | 410 | 515 |
| | | | 390 | 490 | 616 | 772 |
| | | <u>Statement of Cash Flows</u> | | | | |
| | | | 390 | 490 | 616 | 772 |
| | | | 60 | 75 | 94 | 117 |
| | | | 100 | 125 | 156 | 195 |
| | | | 350 | 440 | 553 | 694 |
| | | | 150 | 188 | 234 | 293 |
| | | | 60 | 75 | 94 | 117 |
| | | | -210 | -263 | -328 | -410 |
| | | | 195 | 245 | 308 | 386 |
| | | | 0 | 0 | 0 | 0 |
| | | | 55 | 67 | 83 | 102 |
| | | | -140 | -178 | -225 | -284 |
| | | | 0 | 0 | 0 | 0 |
| | | <u>Balance Sheet</u> | | | | |
| | | 600 | 750 | 938 | 1,172 | 1,465 |
| | | 400 | 500 | 625 | 781 | 977 |
| | | 0 | 0 | 0 | 0 | 0 |
| | | 1,000 | 1,250 | 1,563 | 1,953 | 2,441 |
| | | 600 | 795 | 1,040 | 1,348 | 1,734 |
| | | 400 | 455 | 522 | 605 | 707 |
| | | 1,000 | 1,250 | 1,563 | 1,953 | 2,441 |

Sustainable growth

- What growth rate can a company achieve without requirement additional external equity?
- $\Delta \text{ Assets} = (a+w) \Delta \text{ Revenues}$
- $\Delta \text{ Assets} = \Delta \text{ Book Equity} + \Delta \text{ Debt}$
 $= \Delta \text{ Book Equity} + \lambda \Delta \text{ Book Equity}$
 $= \text{Net Income} (1 - \text{Payout})(1 + \lambda)$
 $= (\text{Revenues}) (\text{Profit Margin})(1-\text{Payout})(1+ \lambda)$
- $g = \Delta \text{ Revenues} / \text{Revenues}$
 $= (\text{Profit Margin})(1 - \text{Payout})(1+ \lambda) / (a+w)$

Sustainable Growth: example

- Back to previous example:
 - $a+w = 0.50$
 - Net Profit margin = 15,60%
 - Payout ratio = 50%
 - $\lambda = \Delta \text{Debt} / \Delta \text{Book Equity} = 28.2\%$
 - $g = [15\% (1 - 0.50) (1+28.2\%)] / 0.50 = 20\%$